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Art. I.—CASE OF SEVERE COMPOUND FRACTURE.

BY S. T. NEWMAN, M. D.

St. Francisville, La., January 4th, 1841.

Dr. Dunglison,

Sir,—If the following case is worth a place in your journal of medicine, it is at your disposal. Respectfully,

S. T. Newman.

On the 24th of February last, I was called to visit Esther, servant-girl, living six or eight miles from Amsterdam, Miss. The girl, I was informed, had broken her leg. When I arrived I found her suffering extreme agony; and upon removing the covering which had been thrown over the affected limb, my sensibilities were shocked at the mangled appearance it presented. I found instead of a fracture (which I expected to see,) a luxation of the joint, made by the foot on one part, and the tibia and fibula on the other, in which the foot was almost torn from the leg; it being torn from the external malleolus upwards and across the instep, down to the tendo achillis; this tendon, however, was not injured. The accident occurred in the following manner: the girl was sitting on the axletree of a wagon, with her legs hanging carelessly down; while in this situation the wagon was driven over a stump, and she not observing it, permitted her foot to be caught between the stump and the axletree. The consequence was, that as the leg was pushed forward and the foot held back, the tibia and fibula were forced through the capsular ligament, tendons, and integument, externally, to the distance of nearly two inches, while at the same time the surrounding soft parts were contused and lacerated (by the cutting edge of the stump) to a wonderful extent. It was the left limb that was implicated, and notwithstanding the foot was driven toward the external malleolus, with a force that will be easily conceived of, yet the tibia and fibula did not lose their attachment, contrary to what might have been expected, when we take into consideration the manner the fibula is allied to the astragalus, so as to form the external malleolus.

The extent of the injury was such as to induce me to think that amputation would be proper. Before modern improvements in surgery, amputation would have been looked upon as inevitable. But bearing in mind the precepts inculcated by Professor Dudley on this subject, viz. that a surgeon

ought to be indictable for a high offence who would deprive a person of a limb of so much importance as either of the extremities, save where the injury is of such a nature and extent as to preclude the possibility of restoration, which he thinks rarely happens;—and recollecting, too, the statement of Mr. Hennen, that it is more honourable to the surgeon to save one limb than to have performed numerous amputations, however successfully:—actuated by these considerations, and ascertaining that there were uninjured vessels sufficient for the nourishment of the foot, and that the girl was also healthy and of good constitution, I determined to make an effort to save the foot; for which purpose I had as suitable an apparatus made as circumstances would admit in which to place the leg. Then having a permanent bed prepared, I set about adjusting the injury. Making a black man (for the overseer of the plantation was absent, and I could, being in the country, get no other assistance,) take hold of the leg so as to steady it, I gradually extended the foot until (with other manipulations which suggested themselves,) I returned it to its place, which, in consequence of the injury the muscles had received, it was not disposed to retain, until forced to do so by splints and a roller, lint being applied over the wound to absorb the secretions. I should have remarked, when describing how the parts were torn, that there was less hemorrhage than might have been expected, the hemorrhage indeed amounting to almost nothing. I now adjusted the limb in the apparatus previously prepared, and leaving further directions to be followed during my absence, I left, for I could not await the time of bleeding.

Visited her early on the 25th. Found she had passed a miserable night. Bowels regular, pulse full and somewhat incompressible. Bled her until the activity of the circulation was reduced. Dressing not removed. Prescription: antimonial powders to be taken during the day, and an opiate at night.

26th. Visited her in company with my friend Dr. Hansford. Upon removing the dressing, the wound presented a very unfavourable appearance. Sanies discharged in large quantities. After washing it with tepid water and Castile soap, dressed it with dry lint, supporting it as before. Pulse strong and somewhat bounding. Abstracted blood to affect the general system. Prescription unchanged.

27th. Visited her again with Dr. H. She complained less of pain, but upon inspecting the wound, so unfavourable were the appearances exhibited, that Dr. H. and myself were fearful it would be incurring too much risk to the constitution to defer amputation. There was considerable sloughing both of muscles and tendon. Large quantities of sanies were discharged. We determined, however, to wait a day or two, to see what nature would do. The wound was cleansed, and emollient poultices applied, to be reapplied at proper intervals.

28th. The wound but little altered. Treatment the same. For the next two or three days there was not much change in appearance; the tendons and muscles continued sloughing. Discharge of matter enormous, but becoming more healthy in appearance. Dead portions of muscle and tendon were from time to time removed, and in the course of a few days appearances of granulations were seen. I continued my visits until the 11th March, and up to this time the wound bore as favourable an aspect as could have been expected, reparation going on in a decided but slow manner. At this period I delivered the girl up to her master, Dr. Joseph Jones, of Vicksburg, who had been absent, but returned to Vicksburg about this time, and visited his plantation immediately upon hearing of the accident. I cannot describe the progress of cure after 11th March, but at this time (September 12), the girl is able to walk about and attend to plantation service. She limps considerably, which in the very nature of things must always be the case, as the joint must ever remain partly anchylosed.

S. T. Newman, M. D.

Art. II.—ON PATHOLOGY OF THE JOINTS.

[We extract the following article, being "a Succinct View of the Present Condition of Knowledge on the Pathology of the Joints," from the last (Oct. 1840) number of the British and Foreign Medical Review,—being a critical notice of the works of Sir B. Brodie, R. Adams, J. Blackburn, L. H. Schumer, and E. J. Lederle.—Ed.]

1. *Diseases of the Synovial Membranes.* The synovial membranes are arranged on the same general plan as the serous, forming, like them, closed sacs. That they pass over the surfaces of the cartilages can no longer be a subject of doubt, since, in addition to the previous strong and almost sufficient evidence in favour of that view, Henle has found, with the microscope, that a fine cellular corium, covered by a delicate layer of epithelium, passes over the exposed surface of all the articular cartilages.[1] There is undoubtedly, also, "some analogy in the diseases" of the synovial and of the serous sacs; but it is far from perfect; and on the very first point which Sir B. Brodie mentions (p. 7), that of "swelling of a joint from a preternatural quantity of fluid collected in its cavity, without pain or inflammation," we find an important difference between the two. The dropsies of serous sacs are of two distinct kinds: in one the fluid passes out from the vessels by a power which is entirely local, by an act of secretion; in the other it transudes from them under the influence of simple mechanical pressure, which may be imitated at will by artificial injections, or its excessive effusion is the consequence of some physical change in the condition of the blood. In the first class of effusions we find the effects of pleuritis, peritonitis, and, more definitely, hydrocele; in the second, the ascites of obstructed partial circulation, and the more general dropsy of obstructed circulation from disease of the heart, in which anasarca of the cellular and other soft tissues coincides with effusion into the serous sacs.

Now the synovial sacs are subject only to the first kind of effusions; to those which arise from a local secretory power. It has often been observed as a distinction between serous and synovial membranes, that the one is commonly, the other never, the seat of simple dropsical effusions, and the difference has usually been ascribed to some yet unseen diversity of tissue, or to a yet more vague peculiarity of vital action. We believe that the cause of the distinction lies in neither of these circumstances; but in the peculiar construction of the cavities which the synovial membranes line, and in the difference between them and most of those that are lined by serous membranes. As the blood passes along the vessels in healthy circulation, just sufficient fluid transudes through their walls to keep the adjacent tissues and surfaces slightly moist; but if the pressure of the blood against the walls of the vessels be increased by any obstacle to the passage of venous blood, or (which comes to the same thing) by an increased force of the arterial blood without any increased means for its passage through the veins, more fluid must of necessity pass through the walls of every vessel that is not supported by the unyielding pressure of some firm substance around it. In all the soft and easily extending tissues, therefore, and in all the cavities with yielding walls, dropsy is thus at once produced, the force of the obstructed blood being amply sufficient to distend those parts. But it is different with the hard tissues and the unyielding cavities, such as the cartilages, the tendons, the cerebro-spinal cavity, and the joints; in these no mechanical dropsy (such as arises from disease of the heart) can take place, for the same force by which the fluid is effused in increased quantity in the parts already mentioned, is totally unable to distend them. Hence, though all the tissues

[1] Ueber die Ausbreitung des Epithelium. Müller's Archiv. 1838, Heft 1.

around them are soaked in fluid, no tendon or cartilage is ever anasarcous in a general dropsy; and this not for want of vessels, but because the walls of those vessels are bounded by unyielding tissues into which fluid could transude only under a far greater force of pressure. For the same reason, while in similar cases the abdomen and the pericardium are distended, and the lungs are compressed by the fluid effused from the obstructed vessels within and around them, the nervous centres in their cavity of fixed and unalterable size, and the joints with their tough, unyielding walls, are unaffected.

The dropsies of synovial sacs, then, are entirely the result of a local act of secretion; they correspond to hydrocele, and to the effects of pleuritis and peritonitis, &c.; but there are no affections of the joints analogous to ascites or the coincident effusion from obstruction into other serous sacs. In passing, we would point out these facts as illustrative of the difference between secretion and mere mechanical effusion: and of the varieties of the forces by which, under different circumstances, fluids are made to pass through the walls of vessels. The force of secretion is in these cases shown to be sufficient to produce, in a few hours, such a distention of a joint as could not have been effected in as many years by the force of exudation exercised by an obstructed column of blood driven on even by an hypertrophied heart.

But this affection, this hydrops articuli, in which an increased quantity of fluid is poured into a joint without pain or inflammation, and in which the fluid differs but slightly from common synovia, is of rare occurrence. The more frequent cause of effusion of an increased quantity of fluid into a joint is a distinct inflammation of the synovial membrane.

On reviewing the cases of this class which Sir B. Brodie relates, as well as those that have fallen under our own observation, it is evident that, as subjects of morbid anatomy, the changes produced by this inflammation present peculiarities of two kinds,—one depending on the peculiarity of the tissue itself, the others on that of its construction and arrangement. The latter have been by no means sufficiently considered, though they are of great importance in explaining some facts which, at first sight, appear anomalous.

As the subject of disease, the synovial membrane cannot be abstractedly considered. Regarded as a homogeneous thin layer of tissue lining the whole joint, it is yet evident that both in health and disease the performance of its functions must be materially influenced by the character of the tissue subjacent to it, and from or through which it receives its vessels. Sir B. Brodie (page 6) states it as a principle to which all will agree, that "living organs are more subject to have their natural functions deranged in proportion as they are more vascular, and as they are employed in a greater degree in the process of secretion." But the degree of vascularity in the synovial membranes of different joints, and even in that of the same joint, is by no means fixed; the same membrane where it lines the articular cartilage is far less vascular than where it lines cellular tissue or fat; less vascular, again, where it is placed on ligament than where it lies on bone or periosteum. The liability to inflammation, and the severity of the results of the same inflammation of a synovial membrane, will therefore be determined, not by a certain vascularity peculiar to itself (as they are in muscle or in bone), but by the vascularity of the tissues beneath it; for the vascularity of the various portions of the synovial membrane is determined by that of the tissue through which each receives its vessels.

We might illustrate this principle of the influence of subjacent tissues upon the diseases of lining membranes by several examples; but we will take only one, that of the inflammation of arteries and veins. The lining membrane of the whole system of blood-vessels is continuous, and in all its parts similar, whether we receive the older view of an internal thin layer of cellular tissue, or the correct demonstration of Schwann, that it is chiefly composed of fibres of elastic tissue, in which, if any, a longitudinal direction is

discernible, and whose surface is lined by a fine epithelium.[1] In either case the linings of the arteries and veins may be considered identical. Yet how different are their diseases. Acute arteritis is one of the rarest affections, but acute phlebitis is of comparatively common occurrence. And in the effects of each there is no less marked a difference; in arteritis the highest degree of inflammation produces only a slight effusion of lymph or adhesion; while in phlebitis, suppuration, and the abundant formation of lymph, are common and almost constant effects. There seems no other sufficient reason for such a difference in the results of the same disease in two tissues of the same kind than this,—that in the one the tissue receives its vessels from a surrounding very vascular layer of cellular membrane, in the other from a layer of elastic tissue, in which vessels are but just demonstrable; and that in each part its own vascularity is directly proportioned to that of its subjacent tissue.

Other examples of a similar kind will at once present themselves to the reader's mind. To apply the principle which they establish to the affections of the synovial membrane: The tissues on which it is placed might be arranged according to their vascularity in the following order: adipose and cellular tissue; bone and periosteum; tendon and ligament; fibro-cartilage; articular cartilage; and as a general rule (to which, however, certain local circumstances will cause individual exceptions,) we think it will be found that the morbid changes of the several parts of the membrane lining these tissues, both in severity and frequency, follow the same series.

When, for example, we examine an old diseased knee-joint, in which the history shows that inflammation commenced in the synovial membrane, we do not find its whole lining equally affected; but by far the most severe results of the disease are seen on the portions beneath which adipose tissue is placed, as above and by the sides of the patella; here it is most thickened, most spongy, most vascular, and covered by the greatest quantity of lymph; on the periosteum around the edge of the cartilage, and on the front of the crucial ligaments, similar effects are much less in degree; and on the surface of the cartilages they are altogether absent. But the synovial membrane is over all these parts, *per se* the same; and there is every reason to believe that all of it is simultaneously and equally attacked by the disease; so that there can scarcely be any other cause for the differences than the different natures of the subjacent tissues.[2]

In like manner (though in the determination of this result there must be many more modifying circumstances), we believe that the comparative frequency of disease of the synovial membrane in different joints, depends in great measure on the degree of vascularity of the tissues by which the walls of each joint are formed. In none is the disease so common as in the knee-joint, and no joint has more of its synovial membrane in contact with adipose tissue; next to the knee in this respect may probably be placed the elbow, and here again a considerable quantity of loose and vascular tissue surrounds the joint; while in the hip, where there is a complete and dense fibrous capsular ligament, with the low degree of vascularity peculiar to that class of tissues, primary disease of the synovial membrane is by comparison of very rare occurrence. Sir B. Brodie regards the exposure to cold as the

[1] Encyclop. Wörterb. des Medicin. Wissenschaften. Art. Gefässe. His view is confirmed by Gutenberg, Raeuschel (De Arter. et Venar. Structura), and Henle, (Ueber die Ausbreitung des Epithel. Müll. Arch. 1838), though in some measure contradicted by Valentin, (Repertorium, &c.)

[2] By this explanation, too, the chief objection urged against the presumed passage of the synovial membrane over the cartilage is destroyed; if the cartilages themselves are obscure in their manifestations of disease, so must be the membranes which are so intimately connected with them, and which receive from them a great part of their vascular supply.

chief cause of the frequency of inflammation of the knee-joint, and Mr. Adams partially coincides in that opinion; the influence of cold cannot be denied, but its sufficiency may be doubted when the disease is far more rare in the wrist and ankle, which are more exposed to cold than the knee, but a greater portion of whose contour is occupied by fibrous tissues.

These circumstances, then, which are often regarded as anomalies, namely, the varied frequency of common inflammation of the synovial membrane in different joints, and the varied degrees of its severity, as exhibited in its products, in different parts of the same joint, are, we believe, fairly explained by the different degrees of vascularity possessed by the surrounding subjacent tissues, from which the synovial membrane receives its vessels. We may now proceed to the diseased appearances whose peculiarities are more probably referrible to the nature of the synovial tissue itself.

The effect most commonly and often permanently left by inflammation of the synovial membrane is thickening. This differs from the analogous change produced in a serous or mucous membrane, by the parts being less dense and firm; the thickened part is soft, and easily tears; it has a spongy œdematous character; its free surface, instead of being smooth and polished, acquires a delicately granulated or almost villous aspect, not unlike that of a granular conjunctiva; and at the edges of the cartilages it often overlaps them, just as a chemotic conjunctiva overhangs the margin of a cornea.[1]

In this condition the tissue of the membrane undergoes no material change; it is only swollen by the effusion of serous fluid, and usually of lymph, into its areolæ, which, if the affection be not complicated with other articular diseases, are often rapidly removed after counter-irritation or other means. There is another state which possesses some, though an obscure, relation to this simple thickening, but which is much more serious in its nature. Sir B. Brodie regards it as a change peculiar to the synovial membranes of joints, and belonging to the same class with tubercle, carcinoma, &c.

"The morbid action evidently originates in the synovial membrane, which loses its natural organisation, and becomes converted into a thick, pulpy substance, of a light brown and sometimes of a reddish-brown colour, intersected by white membranous lines. As the disease advances, it involves all the parts of which the joint is composed, producing ulceration of the cartilages, caries of the bones, wasting of the ligaments, and abscesses in different places." (p. 79.)

This form of disease is that which Dr. Lederle, with most of the German writers, describes as fungus genu, and to which he applies the extraordinary appellation of "dynamico-vegetative pseudoplasm." It is also one (and if they understood any thing definite by the name, the especial) form of disease described by the old writers as white swelling. We are inclined to think that it is more commonly an effect of simple chronic inflammation of the membrane than Sir B. Brodie regards it; its most common situation, the knee, is that in which the synovial membrane is far most frequently inflamed; its history is often that of protracted inflammation; the shades between it and common thickening are so numerous, that they are scarcely separable; and it does not, like other specific or malignant diseases, affect either the same tissue in different parts, or different tissues coincidently. Further pathological investigation is still necessary on this subject; the interest of which is the greater because the disease in its advanced stages admits neither of cure nor alleviation; and if it be in any case the result

[1] In this, as well as in many other circumstances, in both their natural and morbid structure, one cannot but be struck with the closeness of the analogy between synovial membrane and the conjunctiva. The comparison was first made by W. Hunter, who was, indeed, in this part of his descriptions, singularly felicitous; witness the famous comparison of the serous sacs to double nightcaps.

of the neglect of a more simple disease, its prevention should of course be the object of much greater care than is usually bestowed on common stiff joints.

In thickening of synovial membranes, serum and lymph are effused in the areolæ of its tissue, and very generally in the adjacent parts, which become hard, tough, and unyielding, lose all their power of sliding upon one another, and in some cases form an almost homogeneous, brawny, infiltrated mass, in which the dissector has difficulty in discovering even those things that in health are among the most prominent. At the same time lymph and serum may be secreted on the free surface of the synovial membrane and into the cavity of the joint. The effusion of lymph, however, is on the whole less frequent in the synovial than in the serous sacs; a circumstance in which again they appear in some measure intermediate between serous and mucous membranes. The lymph may form adhesions between the opposite surfaces of the membrane; for adhesions are the result of inflammation, not of any particular tissue, but of all tissues which are so arranged as to present two surfaces sufficiently near each other to permit the lymph effused upon one to adhere to that upon the other, and thus in one mass with it to be organised. Where this arrangement is wanting, whatever be the tissues inflamed, it is evident no adhesion between them can take place. In the synovial sacs adhesions are on the whole less frequent than in the serous; probably in consequence of the little power which some of the tissues composing the former possess of producing or receiving new vessels. Thus, suppose lymph effused on the surface of a synovial membrane, opposite a cartilage; the chance that the cartilage will either produce or receive new vessels to communicate with those that form in the lymph is but slight. But there are only a few parts of the joints in which the synovial membrane covering one tissue is not opposed to that covering cartilage, and the adhesions that do form are generally found in these parts, as, for example, where the synovial membrane of the wall of the joint is opposed to its own reflexion over the bone. Hence, in the knee, the frequency of the cases in which the cavity of the articulation is obliterated above the patella, and at the sides of the condyles of the femur, and round the head of the tibia. The cases are rare in which adhesions pass the surface of the synovial membrane covering the cartilages; but they occasionally happen, and are, we think, more common in the ankle than in any other joint. There are several specimens of the kind in the College of Surgeons; and we have seen more than one in which a distinctly vascular adhesion passed from one cartilage to the other without having any connection with the more vascular parts of the synovial membrane lining the walls of the joint; evidence which alone affords as good proof of the vascularity of cartilage as most *facts* in medicine are based upon.

The next degree of the effects of inflammation of the synovial membrane is suppuration. It affords a good example of the production of pus without ulceration; though the doctrine of suppuration from a sound tissue has lost its verbal truth since Henle proved the existence of a synovial and a serous epithelium, and rendered it probable that before pus-globules can be produced from a membrane's surface, the epithelium cells must be removed. The pus is therefore produced from the *raw* surface of the synovial membrane, just as it is from the cutis when its epidermis is removed. The production of pus, like that of dropsies in synovial sacs, is by a process of secretion, which overcomes all the resistance of the walls of the joint, and often distends them to an enormous size. In this case there can be no doubt of the propriety of Sir B. Brodie's advice that the fluid should be let out by an opening made into the joint; the sufferings which the patient endures from an otherwise irremovable and still increasing collection of fluid distending all the tissues around it, at once declare the necessity of the measure. He limits the practice to these cases; and except in considerable collections of pus, we cannot but doubt the propriety of cutting into a joint.

Yet there are many good practitioners who do not hesitate to adopt the same means in many other cases, under the idea that the inevitable anchylosis will be accelerated. Their arguments for this practice, however, seem to furnish their own contradiction; it is true that anchylosis often follows the wound of a healthy joint, and so does death sometimes; but, say they, the opening of a diseased joint is very different from opening a healthy one,—it produces no ill effect, and may be done with perfect safety. But if it produces no ill effect, will it produce anchylosis, which is the most common ill effect that follows it when performed on a sound joint? For what are the obstacles to the occurrence of anchylosis in the common course of the disease which the operation removes? We believe none—unless the opening lets out such a quantity of fluid as was sufficient to separate the surfaces that should adhere. For osseous anchylosis to take place, the cartilages must be removed and the bones exposed; granulations must arise from each of them, and uniting, become osseous; if pus, or any other fluid, keep the granulations apart and prevent their union, it should undoubtedly be removed; but if not, the process will go on as plainly as the union of a simple fracture, and, for aught we can see, it would be as wise to pass a lancet between the ends of a broken bone, under the idea of accelerating their union, as to open a joint not full of pus, in the hope of accelerating its anchylosis.

If the pus be not artificially removed from a joint, it will slowly make its way out by ulceration through one of the spaces between the dense tissues of the walls, or if the joint have a capsular ligament, through the meshes of its fibrous fasciculi. The aperture first forms where the resistance is least, in accordance with common physical laws; the fluid pressing equally in all directions, distends, and produces its injurious effects most rapidly where the parts are weakest. The artificial opening of the distended joint is thus the more advantageous, because it is a rare coincidence in which the weakest is at the same time the most dependent part; and a naturally formed opening will seldom be placed so as to permit the the fluid to pass off by it rapidly enough to keep the joint empty. Thus, in the knee, openings most frequently form at the sides by the lateral ligaments; or in front, just by the sides of the ligamentum patellæ; or if they form behind, it is too often by the pus creeping through a long and tortuous course, in the ham and down by the heads of the gastro-cnemii. An artificial opening may of course be made wherever the patient's position and other circumstances render it most desirable; cæteris paribus, that which Sir B. Brodie recommends, in the most depending part, will be the best.

That important morbid condition in which pus is simultaneously deposited in a number of joints is still, as to its pathology, most obscure. Scarcely any advance has been made in our knowledge of it since Mr. Arnott's admirable paper on Phlebitis was published in the Medico-Chirurgical Transactions. Of its frequent coincidence with phlebitis there can be no doubt; but it is far from proved to be a consequence of it: on the contrary, cases are not wanting in which the venous system, though carefully examined, has been found quite sound. On all connected with these cases much more evidence is yet required; and it is to be hoped that their explanation will be one of the first practical results of the microscopic observations on pus and suppuration, which are now occupying so many active minds, but have as yet been lamentably barren of profitable results.

In the natural progress of disease, the pus formed in a joint will pass out of it by ulceration; it is much more rare for it to pass from without inwards, and by ulceration to produce perforation of a joint. But such cases (though as yet, we believe, almost undescribed,) do occur, and they are perhaps the most terrible, in their symptoms and progress, of all the diseases that affect the joints; for they are equal to the ulcerative perforations of the serous sacs in their rapidity of local progress, and though less quickly fatal, are even far more painful than they are. Happily the conditions in which

they can occur are but few; they are only those in which a collection of pus is formed in some tissue adjacent to a joint, and is prevented from making its way externally by some dense unyielding substance between it and the surface of the limb. This is sometimes the case when the head of a bone is necrosed, or has a suppurating cavity formed within it; as the fluid increases, and the bone around it is removed, it may at last perforate the joint through the ulcerated cartilage, and the destruction that follows it is alike rapid and painful. More rarely, an abscess formed externally to the joint opens into it at some part where the synovial membrane is guarded by weaker tissues than those which lie superficially to the pus, and in these cases, also, a rapid destruction of cartilage, with intense inflammation of the synovial membrane, and the most acute suffering, are sure consequences. Amputation, which the severity of the symptoms at once demands, probably affords the only prospect of recovery.

We have considered the several degrees of the affection of the synovial membrane separately, because it is of the utmost importance in their treatment to know that in the early stages of disease of the joints only this part may be affected, and that, therefore, the limb may by timely and proper care be restored to complete health. Sir B. Brodie particularly insists on the necessity of knowing what the early conditions of these diseases are, before they have proved fatal to the limb or life by involving all the tissues adjacent to that primarily affected. It is probably from lack of opportunity of observing these early changes, that nearly all writers but himself describe the affections of joints as so complex, and so rarely isolated in any one of the tissues composing them. This is in some measure the case with Mr. Adams, who, though not denying the probability that the diseases of a joint may commence in any one of its tissues separately, yet refuses to take advantage of the evident distinctions that might be founded on that fact, and writes of inflammation of the hip-joint (*arthritis coxæ*) in general, distinguishing only the three forms of acute, strumous, and chronic rheumatic inflammation; and of the diseases of the knee-joint, under the general name of arthritis genu, distinguished only into acute, simple chronic, chronic rheumatic, and chronic strumous arthritis. This, however, is depriving morbid anatomy of much of its practical benefit. To be sure, when we get a diseased joint to look at, it is in general only when it had ceased to afford any hope of ever being useful to the patient, and when he is either dead or maimed; and then, no doubt, we may find the ravages of synovitis, chondritis, osteitis, and many more such enemies, as formidable in nature as in name; but we should remember that there probably was a time when there were fewer to contend with; that all these crept in one by one, each establishing himself on the ground near that which was already occupied by one of his allies. If any thing is to be done for the cure of this class of diseases, it must be attempted before many of the tissues are affected; the chances of benefit are always inversely to the number of those terrible *ites*, and the more separately we consider them all, the better shall we be prepared to combat with each.

[To be continued.]

Medical Institute of Louisville.—The annual catalogue of this institution gives the names of 205 students now in attendance. Of these there are—from Kentucky, 70; Tennessee, 50; Alabama, 21; Indiana, 19; Mississippi, 17; Ohio, 8; Missouri, 5; Illinois, 4; Arkansas, 4; Georgia, 2; South Carolina, 1; Virginia, 1; New York, 1; Texas, 1; Iowa, 1.

Geneva College, New York.—The annual catalogue has the names of 136 matriculates attending during the present session.

Art. III.—REPORT OF AN OPERATION FOR THE REMOVAL OF A LARGE BONY TUMOUR, CALLED "SPINA VENTOSA OF THE SKULL."

BY GEORGE M'CLELLAN, M. D.

Professor of Surgery in the Pennsylvania Medical College.

[The following article, which appeared in the January number of the American Phrenological Journal, ought not to belong exclusively to the phrenologists. It is certainly equally interesting to the unbeliever in the "science;" and is well worthy of attention in its surgical relations.—Ed.]

Early in the month of December, 1838, Thomas Richardson, a resident of the city of Pittsburg, called on me for surgical aid. He was then twenty-two years of age, and had been afflicted about three years with a tumour upon the vertex of his skull. About six months before the first appearance of the tumour, he received a severe blow from a missile on the affected region, after which he occasionally experienced tenderness and pain there. As the tumour gradually increased, it produced a determination of blood to the head, attended with a sense of fulness, and a giddiness on stooping. But he was not deprived of any intellectual power; nor were any of his sensations or muscular actions disturbed.

The tumour was very hard and unyielding, and had been pronounced to be an *exostosis* by every surgeon who had examined it. It was oblong in shape, being four inches in the long, and three and one fourth in the short diameter. It was raised in the centre about one and three fourth inches above the surrounding portions of the outer table of the skull, and extended from about an inch beyond the sagittal suture on the right side obliquely to the left, and backwards over the adjacent portion of the left parietal bone. It occupied, phrenologically, the organs of firmness, self-esteem, approbativeness, and a part of cautiousness, on the left side.

I was induced to undertake an operation for extirpating this tumour, chiefly because no symptoms of cerebral affection could be discovered other than those which a moderate determination of blood to the head might produce. Two long incisions were first made at right angles near the centre of the swelling, and afterwards the scalp was dissected up from the whole surface, and, to some extent, around the sound bones. With a long, narrow saw, held in a tangent to that portion of the circumference of the cranium, I then cut off the entire tumour, apparently at its base. The saw moved with difficulty while it was passing through the external table, but with great ease when it was acting upon the interior of the mass. This first led to the suspicion that the disease was not an *exostosis;* and when the prominence had been removed, it was made evident that a far worse state of things had to be encountered. The exposed surface presented perpendicular cells, or cavities, like those of a honeycomb, which were filled with a bloody, or pulpy and sanious matter. The case was at once decided to be a *spina ventosa* of the skull, and it was therefore deemed necessary to extract the whole mass from the surface of the dura mater beneath. A long and tedious extension of the operation was then undertaken. The whole mass of the tumour was circumscribed by the circular edge of a small Hays's saw, and the mass was pried out in successive fragments by an elevator, occasionally aided by the bone nippers and forceps. This part of the operation proved exceedingly difficult, for the tumour extended inwards much deeper below the internal table, than its outer surface had risen above the external table of the skull. Finally, however, a removal of the whole morbid structure was effected, and the dura mater was exposed, thin and livid in appearance, at the bottom of a deep cavity which the bystanders estimated to be capable of holding four and one half ounces of water. There were no pulsations

visible, although the circulation was strong and full. Some small spiculæ of bone adhered to the dura mater, which were extracted by the aid of forceps. In extracting the last of these, which appeared to penetrate the dura mater, a prodigious gush of venous blood issued, after which the patient fell into a convulsive syncope. The hemorrhage was supposed to proceed from the longitudinal sinus, and was therefore arrested by graduated compresses and a bandage. The angles of the wound were brought as near together as possible over the compresses, for the purpose of affording support to them while they were confined by the bandages. Very little irritation resulted from this operation.

In nine days the compresses were loosened by suppuration, and, on removing them, the whole of the exposed surface was found to be granulating, and the orifice in the great sinus was closed. But the brain had not risen up to occupy the exposed cavity; and it was found impossible to place the flaps of the scalp in contact with the dura mater in the usual way, so as to close the wound. Mild dressings of patent lint were applied over the surface, and confined with moderate pressure by means of a double-headed roller. On the twelfth day after the operation, the cavity below the bone was evidently diminished, and every day thereafter it continued to decrease, until, in the fourth week, the surface of the brain covered by the granulating dura mater had risen up to the level of the inner table. The natural pulsatory motions did not appear, however, until the cavity was nearly filled; and, in the mean time, forcible pressure could be made on the surface of the brain without exciting any degree of stupor or inconvenience on the part of the patient. But as soon as the pulsations began to appear, every kind of pressure proved irritating to the brain. At the same time, a remarkable change took place in the character and bearing of the patient. He then became exceedingly timid and irresolute. It would render him pale and almost pulseless to approach him with a pair of scissors for the purpose of trimming away his hair from the margins of the wound; and the sight of a piece of lunar caustic, or a pair of forceps, in the surgeon's hands, would throw him into great trepidation. This state of his mental faculties continued for a long period after his complete recovery from the wound. He could not even go down into a cellar containing some plaster busts without a sense of faintness and sinking; and the operation of taking a cast of his head in plaster nearly prostrated all the functions of his mind and body. His carriage also became remarkably affected. Instead of retaining his natural erect posture and bearing, he sunk his head and shoulders into an awkward stoop, and looked timidly and anxiously forward, as if he was afraid of blundering against a door-post.

At the time of the operation, and until the pulsations of the exposed portion of his brain returned, he was remarkable for his firmness of mind and resolution. No patient ever bore a severe and protracted operation with more intrepidity. He sat upright in a chair, without any confinement, until the blood-vessel gave way at the close of the operation; and during its performance, he repeatedly inquired of the bystanders if it was the brain which was coming out under the efforts of the surgeon. It has been, moreover, stated by those who have known him well for years, that previous to this injury he had always been distinguished for his firmness, courage, and independence.

He is now (two years after the operation) living in perfect health at the Exchange Hotel, Pittsburg. He is engaged in active business, and is entirely exempt from any symptom of a return of the disease. His former firmness and intrepidity of mind have been gradually returning for a year past, and at present no departure from a healthy condition of mind or body can be discovered. A thickening or induration of the flaps of the scalp, which resulted from their long exposure and separation from the subjacent dura mater, and which at one period gave origin to a report that the disease

had reappeared, has become entirely softened down and attenuated, by the natural process of absorption.

As this case occurred during the period of Mr. Combe's first course of lectures in Philadelphia, it excited great attention among all phrenologists. One of the gentlemen who attended the operation addressed a letter to Mr. Combe, stating that both organs of firmness were lost or destroyed; and asked for an explanation of the apparent contradiction in the conduct of the patient to the principles of phrenology. Mr. Combe read this letter publicly to his class, and endeavoured to explain away the difficulty, by locating the position of the tumour posteriorly to the organs of firmness. On a further and subsequent examination of the wound, however, he decided that a great portion of the skull over the region of firmness had been removed, together with that of several of the neighbouring organs, as I have enumerated them.

In no respect, however, does this case militate against the principles of phrenology. The organs, instead of being destroyed, were merely displaced or depressed by the growth of the tumour, in the same way that deformities are produced in some of the savage tribes by gradual pressure of the skull. Perhaps a better analogy may be drawn between the state of these organs and the parts of the brain pressed upon by internal effusions of blood, and depressed fractures, which do not produce the symptoms of compression. A compensation is then made for the space occupied by the effused blood or depressed bone, by a corresponding amount excluded from the cavity of the vessels, and retained in the general circulation.

A careful examination of this case will, I think, elicit observations in support of phrenology. The tone and excitement of the depressed region of the brain must probably have been increased by the invasion of the tumour, on the same principle that the muscles of labouring men are sometimes supported by leathern straps and bandages. On the other hand, the extirpation of the tumour must have had the same effect in removing the tension and mechanical support of the organs, as tapping for abdominal dropsy exerts upon the viscera of that great cavity. As soon as the depressed convolutions began to be unfolded or distended by the pulsation of the blood-vessels, they experienced a want of that pressure which had before stimulated them into an increase of activity. Their tone then became enfeebled, and continued so until the scalp had contracted adhesions to the outer surface of the dura mater, and the cicatrix became consolidated, so as to afford a firm and counteracting support to the pressure of the circulation below.

While Mr. Richardson was recovering from the operation, he was visited by several phrenologists, for the purpose of establishing the precise location of the wound. Although they differed in their opinions in regard to the degree in which the organ of firmness was involved, they all agreed that self-esteem was affected, and some thought the injury extended also to the organ of concentrativeness. Inquiries were therefore directed by them to the manifestations of these faculties; and the patient did suggest some points of character in relation to which he conceived he had undergone an alteration. He asserted that he had for a long time previous to the operation lost his self-respect in the presence of company, and his power of confining his mind to any particular train of thought. But these peculiarities were not obvious to me, or to any of his familiar friends; and I have not thought it right to put them down in my estimate of his condition, as affected by the operation. Such affections may have been the result of that confusion in the mind which generally accompanies excessive determination of blood to the head. It has been suggested that they were produced by a paralysis of those organs which were most severely depressed by the deepest portion of the tumour; while, at the same time, the convolutions which lay under the edges of the tumour, and were only slightly pressed upon by it, were stimulated into increased activity of their functions. I will leave the decision of this point, however, to more experienced phrenologists, trusting that the facts which I have here given will be judged of according to their merits.

BIBLIOGRAPHICAL NOTICES.

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Dr. Robinson on Delirium Tremens and Insanity.[1]

We are glad to receive this report from its estimable author. It is creditable to his literary and professional qualifications; and contains—what is always interesting to us, and especially so at the present time—an eloquent appeal in favour of the insane poor, whose condition appears to be as deplorable in Maryland as it is in this commonwealth.

Dr. Robinson has done us the honour to cite from our "second appeal," which we intend to insert in the "Library," as we did the former appeal, inasmuch as it contains facts and arguments that may be of service hereafter.

In the treatment of his cases of delirium tremens, Dr. Robinson's experience does not exactly accord with our own. Emetics, especially of salt, he has found of great value, when given at an early period, and we doubt not that they are often of service; but we cannot subscribe to the mixed opiate and alcoholic treatment which he advises. We had occasion recently to mention, that the cases must be few indeed in which alcohol is indispensable; and from a comparison of statistical results, we are satisfied that the number of thorough cures is not as great where alcohol is freely given as where it is withheld or administered with exceeding caution. When Dr. Robinson affords us a tabular view of the results of both modes of treatment, and establishes the superiority of the alcoholic, the opiate, or the mixed method, we shall bow, but not until then. But we need not repeat the views which we entertain on this matter, as they are familiar to our readers.

We extract the philanthropic appeal of the author to the people of the state of Maryland on the subject of a state asylum for the poor lunatic, and are glad to see so able an advocate of his claims on the commiseration and justice of the community.

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The gentlemen of the board of trustees of the Baltimore Alms House, anxious to ameliorate the condition of the lunatic inmates, and convinced of the impractibility of instituting such a moral and physical treatment as is best calculated to restore them to health, unless in an asylum exclusively devoted to the insane, have already called the attention of the city and county authorities to the necessity of some more appropriate disposition of them, and have directed a few additional apartments to be prepared for their present accommodation. We are pained to acknowledge the inevitable necessity we have sometimes experienced, from the crowded condition of the cells and the large number of lunatics, of treating our delirium tremens patients in the immediate vicinity of, if not in the same apartment with, insane patients.

Seventy lunatics are now confined in this alms house alone. Twenty white males; thirty white females; seven black males; thirteen black females; besides twelve idiots. A portion of these are foreigners; some are individuals from other states, and some from other counties of this state,

[1] Report of Cases of Delirium Tremens occurring in the Hospital of the Baltimore Almshouse, with Observations; to which is added an appendix comprising an Appeal on Behalf of the Insane Poor of Maryland. By A. C. Robinson, M. D., one of the Attending Physicians. 8vo, pp. 47. Baltimore, 1840. (From the Maryland Medical and Surgical Journal, vol. 1.)

who find their way or are sent to Baltimore wholly unprovided for, and consequently have no other asylum but the alms house.

The whole number in the state of Maryland, including those confined at private houses, and such as continue immured in the county poor houses and jails, will soon be reported by the marshal. If the proportion to the entire population approximate that in other states, the new census will show a large class of indigent beings, afflicted with a malady now known to be curable in the proportion of ninety per cent. of recent cases, under an early and judiciously directed physical and moral treatment. Yet the sufferers, whose only crime is their poverty and disease, are treated as if unworthy of sympathy; forgotten in their prison-houses, where they are allowed little beside "the poor privilege to breathe," chained like convicts, or associated with vagrants, as was formerly the case in all parts of Europe, as well as in every portion of the United States, when, under the errors of a false philosophy and the force of prejudice, insanity was viewed as an infliction, the attempted removal of which was deemed idle, if not presumptuous.

When will Maryland arouse to the necessity of following the benevolent example of most of her sister states, in providing some suitable asylum for her insane poor,—where they may enjoy those comforts and conveniences, those occupations and amusements, which are acknowledged to be indispensable to alleviate, if not to cure? In such an asylum, how many would be restored to "mental existence" and usefulness, whose hallucinations are now aggravated,—the disordered functions of their brains goaded to excess, resulting in organic change and permanent fatuity, by being uncomfortably kept in crowded apartments, subjected, perhaps, to some form of personal restraint to protect them from each other; deprived of the benefits of exercise, amusement, and occupation; a condition as well calculated to induce insanity in a healthy individual, as to render it perpetual when once manifested.

Science and philosophy have triumphantly proved the curability of insanity, if attended to early; and the people of Maryland cannot continue deaf to the claims of this most unfortunate class of her citizens, and refuse to aid their escape from the justly dreaded deprivations of permanent insanity, and consequent confinement in the comparatively comfortless apartments of poor-houses, and the ill-ventilated, grated, and cheerless cells of county jails, identified with felons and vagrants.

Will Maryland allow herself to be longer—now almost half a century—behind France, Italy, and England; indeed nearly all Europe, and many years behind Maine, Massachusetts, New Hampshire, Vermont, Connecticut, New York, Virginia, South Carolina, Tennessee, Kentucky, and Ohio, in the good work of providing for her pauper lunatics? Will she still allow them to remain shut up, two, three, four, or more, together, without even the poor consolation of being alone in their misery?

The destitute condition of the insane poor of our state is, in truth, a dark blot upon her otherwise fair escutcheon, which, we trust, will soon be removed. Instructed by the experience of her sister states, that on the score of economy it is her interest, we hope she will follow the clear dictates of policy, if not of pity, and no longer refuse to make proper provision for this class of her citizens.

Bountifully providing for the destitute widow, orphan, and invalid, for the mute and the blind, can she permit her soil to continue one of the few spots where the poor lunatic is forgotten amidst her public charities, and left destitute of the comforts of existence, and every means of mental tranquillity! We hope not. But regarding the very partial provision made two years since, in 1837–8, by the appropriation of $30,000 to the Maryland Hospital[1]

[1] On the 3d of April, 1838, a resolution, offered by Dr. Stephen Collins, a delegate from Baltimore city, passed the legislature of Maryland, in favour of the Maryland Hospital, by which $30,000 were appropriated for its completion,—distinct reference

as an earnest of her future disposition and efficient action, we fervently pray that at an early day an asylum and a home may be given by the state to every destitute subject of mental disease within her limits.

An eloquent appeal has again been made in behalf of the insane poor of our sister state, Pennsylvania, which we doubt not will prove effective, so well is it calculated to re-enlist the active sympathies of her enlightened philanthropists in behalf of those who are no longer regarded, and should be no longer treated, as outcasts. Her chief magistrate, as her organ, in withholding his sanction (the necessity of which he deplored, but thought imperious, from the exhausted condition of the treasury,) from a bill making provision for the numerous insane poor of that extensive commonwealth, which was passed by the legislature two years ago, has avowed it to be her religious duty to provide, at her earliest ability, for the removal of so manifest an evil from amidst her people. And it being now shown to be her interest on the score of economy[1] alone, Pennsylvania, we are sure, will not

being had, in making the improvements, to its exclusive use as a *Lunatic Asylum*. This resolution contains the following clauses: "*Provided*, that one half of said institution shall hereafter be appropriated to the accommodation of pauper lunatics of this state, who shall there be accommodated and treated at the expense of the county so sending such lunatic paupers; provided the same shall not exceed one hundred dollars for each pauper lunatic so sent."

This appropriation has proved totally insufficient to supply the necessities of the pauper lunatics of the state. Their number is estimated at not less than two hundred and fifty. The sum of one hundred dollars, to be paid by the counties to the hospital, is too small to bear expenses. It has been stated by Dr. Steuart, President of the Maryland Hospital Board,—a statement corroborated by the reports of the most economically conducted institutions at the north,—that the food, nurse-hire, medical attendance, and medicines of each patient costs one hundred dollars; and that clothing and fuel would cost twenty-five dollars additional. This loss the institution bears out of the small profits derived from the private patients.

It seems, however, that the counties very seldom avail themselves of this provision, preferring to continue their unfortunate lunatics in their poor-houses or jails, at an expense calculated not to exceed fifty dollars, with scarcely a chance afforded of recovery,—rather than incur the additional expense imposed by placing them at a hospital appropriated to the insane; where alone, if not restored to health, their condition may be so improved by a judicious course of moral government, seconded by cheerful exercise and healthful occupation, as to render them once more comparatively contented and useful. By this ill-judged economy, insanity is aggravated, and the sufferers continue during life totally helpless and dependent. Whilst, had their home been at a lunatic asylum, their moral, mental, and physical capacities would be so directed as to be conducive to their individual support, simultaneously with the improvement of their health and condition.

According to the census of Maryland for 1830, there were 291,108 white persons; 52,938 free coloured; 102,994 slaves;—total population, 447,040.

The census of Maryland for 1840 is not yet completed. From data supplied by the marshal, the number of insane, mutes, and blind, are estimated as follows. (The returns are evidently but partially correct.)

Number of insane and idiots at private charge, 193 whites, and 92 coloured.
" " " public " 127 " 72 "
" deaf and dumb, 157 whites, and 67 coloured.
" blind, 153 whites, and 82 coloured.

Two counties, Carroll and Caroline, not included in the above.

[1] See a Second Appeal to the People of Pennsylvania on the subject of an asylum for the Insane Poor of the commonwealth. Philadelphia, 1840. [Reported by a sub-committee, through their chairman, Dr. Dunglison.]

"A distinguished writer on insanity, M. Brierre de Boismont, who has published a work within the last year on the influence of civilisation on the development of insanity, and who considers the disease to prevail, as a general rule, in a direct ratio with the state of civilisation of the people,—estimates the proportion of insane in different countries as follows:—State of New York, 1 in 721; England, 1 in 783; Scotland, 1 in 563;

neglect this "Second Appeal." And for the sake of the character of our native state, we hope that Maryland will not be behind her in the benevolent undertaking and Christian duty. To induce union and efficient action in order to effect so necessary and desirable an object, we earnestly appeal to the state and city authorities, as well as to every philanthropist, and every Marylander. For who, in this enlightened period, so characterised by wisely bestowed and extended charities, will acknowledge himself without sympathy for, and consent longer to forget, the insane poor.

"Who that bears
A human bosom hath not often felt
How dear are all those ties which bind our race
In gentleness together, and how sweet
Their force, let Fortune's wayward hand the while,
Be kind or cruel?"

Dr. Robinson has added a report of the lunatic department of the Baltimore Alms house; from which it appears that the number of patients is 76: 36 males, and 40 females.

Dr. Wood's Obituary Notice of Dr. Parrish.[1]

This is the production of a liberal and enlightened gentleman, desirous of doing full justice to the respected subject of his memoir. Of the career of Dr. Parrish it is not necessary to add any thing in addition to what has already appeared in the pages of the "Intelligencer;" but they who are desirous of knowing more of his private and professional history will do well to seek for it in the notice before us, which is from the pen of a favourite pupil, and one capable of appreciating all his merits.

The late Professor Green, of Jefferson Medical College.—It is with the most profound regret that we have to notice the sudden death of our friend and colleague, who as a man was most estimable, and as a professor of chemistry signally zealous and successful. Hereafter we shall give a brief notice of his useful career.

Norway, 1 in 551; France, 1 in 1,000; Districts on the Rhine, 1 in 1,000; Belgium, 1 in 1,014; Holland, 1 in 1,046; Italy, 1 in 4,879; and Spain, 1 in 7,181.

"The proportion in the large cities he enumerates as follows:—London, 1 in 200; Paris, 1 in 222; Milan, 1 in 242; Florence, 1 in 338; Turin 1 in 344: Dresden, 1 in 466; Rome, 1 in 481; Naples, 1 in 791; St. Petersburgh, 1 in 3,133; Madrid, 1 in 3,350; and Grand Cairo, 1 in 30,714.

"In New Hampshire, when the population did not exceed 280,000, the number of lunatics was estimated at 600; in Connecticut, in a population of 298,000, at 700; in Massachusetts, with a population of about 612,000, there were 1,000; in Virginia, taking the population at 1,200,000, it was considered that there were, in 1838, not fewer than from 600 to 800 insane; and it is probable that there are at this time in Pennsylvania, in a population not exceeding 800,000, not less than 2,000 insane,—of whom, if we take the state of New York as a guide, the proportion of idiots will be about 1200, and of lunatics 800."—*Idem.*

[1] A Memoir of the Life and Character of the late Joseph Parrish, M. D., read before the Medical Society of Philadelphia, Oct. 23, 1840. By Geo. B. Wood, M. D. 8vo, pp. 72. Philadelphia, 1840.